Unlocking historic landscapes in the Eastern Mediterranean

Unlocking historic landscapes in the Eastern Mediterranean: two pilot studies using Historic Landscape Characterisation

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Historic Landscape Characterisation (HLC) maps landscape with particular reference to its historic character and development. Executed using sources including satellite imagery and aerial photography and presented in a Geographic Information System (GIS), this offers a powerful insight into a landscape story. Here two leading advocates of the approach apply HLC for the first time to historic landscapes in the Eastern Mediterranean.

Keywords: Aegean, medieval and modern, Historic Landscape Characterisation, HLC, GIS, field systems

Introduction

Landscapes provide a central concern for many disciplines, and the best ways to understand, value and manage them are hotly debated. Richard Bradley has observed a split in landscape archaeology between economic/functional and social/symbolic approaches (2000), a theme recently taken up by Matthew Johnson in his *Ideas of landscape* (2007). Such divisions can also be traced in related disciplines including history and geography (Widgren 2004). Scholars and surveyors have created detailed and accurate records of ancient remains, but have often

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struggled to link them with past social processes or to appreciate that landscapes were not just simple reflections of economic and technological trends (Johnson 2007: 119-27). Steeped in a different tradition are post-modernists, including many cultural geographers, post-processual archaeologists, and theoretically-minded historians. They have stressed that landscapes are not static but always contested, always changing, constantly negotiated and culturally constituted (Olwig 2004: 48). Particularly in the case of cultural geography, the emphasis on representation has led scholars away from the empirical research of traditional landscape studies towards more openly reflexive and overtly theoretical writing (Cosgrove & Daniels 1988).

Archaeological studies in the post-processual tradition have attempted to employ explicitly phenomenological approaches to provide viewpoints on past landscapes (e.g. Bender *et al.* 1997). Although these approaches have attracted various criticisms (Forbes 2007: 36-44), post-processual archaeology is well-placed to develop rich perspectives on landscapes because it has continued to engage with material culture and with landscapes as the contexts for social life. Rather than seeing landscapes as neutral canvasses, which only exist and become active when the perceiver's gaze is cast upon them (what Bob Johnson described as 'explicit' perception), for many archaeologists there should be no division between 'real' landscapes and people's 'perceived' landscapes ('inherent' perception: Johnson, R. 1998). This engagement with material culture and landscape has helped anthropologically-minded archaeologists develop perspectives that emphasise the multi-dimensionality of everyday landscapes (Ingold 2004; Forbes 2007: 18-49). Along with the importance of landscape and material culture as context, archaeologists' appreciation of the time-depth present in the archaeological record has led many to share the *Annaliste* historians' concern for following trajectories of change over the long term (Morris 2000). Through this historicity, archaeology can provide particular insights into the meanings of landscape that are relevant, not only to understanding the past, but also the present and future (Ingold 2000: 208).

An unfortunate result of the widening divergence between scholars working in empirical and post-modern traditions is that each side seems to have forgotten that anything much might be gained from reading each others' work (Johnson, M. 2007; see Fleming 2007). But one of the main lessons of archaeological theory is surely that different people in the past or present see the same thing in diverse ways thanks to their varying perspectives. In our view, integrative landscape archaeologies hold out the possibility of transforming mutual incomprehension into deeper, better-informed awareness of past and present landscapes by bringing together many viewpoints in unified frameworks. Our thinking in this is influenced by recent developments in international policy, in particular the signing and ratification by 33 countries of the European Landscape Convention (ELC) (CoE 2000; Déjeant-Pons 2006; Turner & Fairclough 2007). The ELC states explicitly that landscape is:

> *'. . . an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors' (*CoE 2000: Article 1*).*

This definition is much broader than others used to inform heritage management, such as the UNESCO criteria for recognising outstanding cultural landscapes (Cleere 1995). Rather than defining particular places as 'outstanding', the ELC recognises that landscape is ubiquitous and that all landscape has some value as perceived by people. In future, it may be

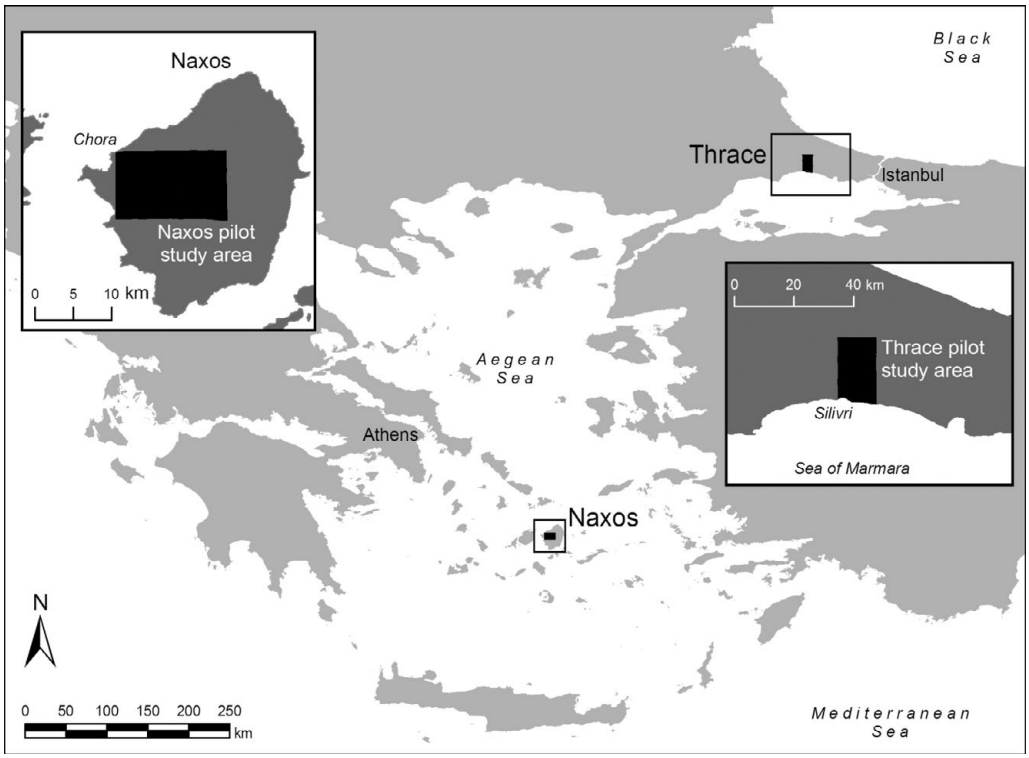

Figure 1. Map showing the location of the two pilot studies.

possible to develop frameworks that bring together not only social and economic approaches, but also those from a whole range of other disciplines, professions and perspectives. Using GIS-based techniques such as Historic Landscape Characterisation (HLC), we may be able to map, analyse, compare and contrast the perceptions of a wide range of people working with the landscapes of the past, present and future (Turner 2006a). This will surely help us to open up debates on the past and future of our landscapes.

Although this paper does not attempt to outline how HLC might fulfil this wide-ranging role, it demonstrates how it has helped us to appreciate certain aspects of landscape history, using two case studies in the Eastern Mediterranean (Figure 1). Archaeological field survey over the past 30 years has transformed our understanding of many Mediterranean landscapes. Nevertheless, there remains a tendency to focus on Classical and earlier periods (e.g. Price & Nixon 2005), while medieval and post-medieval landscapes (Byzantine, Venetian, Ottoman, modern) are less well understood (Cherry *et al.* 1991; Cherry 2003; Vionis 2005). As historical archaeologists, we are particularly interested in how the landscape has developed, and how it was organised at different times in the past. In Britain, HLC is widely appreciated as a useful way to model past landscapes and how they changed over time to take their current forms (Turner 2007). The aim of our research has been to investigate whether similar methods might be used in Mediterranean contexts. In future, our maps – which represent our perceptions of historic landscape character – could form one layer amongst

many in Geographical Information Systems (GIS) used to facilitate debate on the value of these landscapes and how they should be managed.

Our two case studies are located on Naxos (Greece) and in the hinterland of Silivri (Thrace, Turkey) and it is in these places that we adapt and apply Historic Landscape Characterisation (HLC) for the first time in the Aegean region.

Historic Landscape Characterisation

It has only recently become possible to marshal easily the large volumes of data needed to undertake in-depth study of extensive landscapes. In the past, the problems of using cumbersome sources, like paper maps, meant that such comparative work was massively time-consuming. GIS now provides tools for combining and comparing huge and diverse datasets including satellite imagery, aerial photographs and digital mapping. In particular, methods developed over the last 15 years in Britain, such as HLC, can provide frameworks for diachronic landscape histories that incorporate data from relevant sources at a range of scales (Rippon 2004). With a few exceptions (e.g. Dingwall & Gaffney 2007), archaeologists and landscape historians have yet to explore the potential of these techniques in the Eastern Mediterranean and many other regions.

In the 1980s and early 1990s, British archaeologists became increasingly aware that, beyond specific monuments, the cultural landscape was often ignored during development and planning in the UK (Herring 1998: 7-8). In response to this problem, English Heritage sponsored research projects that led to the development of HLC as a way to present and analyse the historic nature of the whole landscape (Fairclough *et al.* 1999).

HLC maps differ from traditional archaeological databases for storing and presenting landscape data (Turner 2006a). Archaeological databases normally provide lists of sites together with a range of associated information. Some are very sophisticated and increasingly they are accessible over the internet (e.g. Scotland's National Monument Record (CANMORE: http://www.rcahms.gov.uk/canmore.html); various UK Historic Environment Records (see http://www.heritagegateway.org.uk/gateway/); in Turkey the TAY project provides an overview of web-based inventories: TAY 2008). These inventories provide crucial tools for research, landscape management and planning, particularly where the preservation of particular sites is concerned. Nevertheless, they do not provide total records of the historic environment. Site location data is usually limited to a dot or a line on a map, so it can be hard to appreciate an individual monument as part of a historic landscape. In addition, such inventories cannot record *everything* of historic interest in any given locality. The 'ordinary' features that combine to give places their particular historic character (vernacular buildings, field boundaries, lanes, trees, etc.) are often neglected or only partially represented.

HLC provides a complementary technique that can help deal with these problems. Unlike inventories, HLCs do not map individual archaeological features. Instead, HLC is a generalising technique that bundles together features linked by their historical development and maps them as areas. The method was pioneered in Cornwall (UK), and has been described by its developer there as follows:

> *'Closer examination* [of the landscape] *reveals that particular groupings and patterns of components which recur throughout the county can be seen to have been determined by similar histories. Cornwall's historic landscape can, therefore, be characterised, mapped and described, using a finite number of categories or types of "historic landscape character"'* (Herring 1998: 11).

A range of HLC 'types' is usually classified in advance of mapping. The characteristics each type might be expected to exhibit are identified through archaeological or historical case studies. The researcher therefore needs to understand how patterns in the landscape reflect its historical development, and how physical features in the landscape relate to each other. Like other types of landscape archaeology, HLC mapping is a subjective process of interpretation that is informed by the physical landscape.

Since relatively little work has been undertaken on the landscape history of Naxos or Thrace, we used *retrogressive analysis* of parts of our study areas to help inform the HLC mapping. Retrogressive analysis is a technique for unravelling the physical and chronological relationships between different elements in the historic landscape (e.g. roads, field boundaries; Oosthuizen 2006: 77-9), and this has helped us refine the landscape character types and provide increased chronological definition for our characterisation.

A recurrent problem is that some areas may include features from several different eras that contribute strongly to overall character, so that it is unclear which 'type' should be mapped (e.g. field systems created in the nineteenth century may contain many features built earlier, such as terraces or field boundaries). Using GIS with an explanatory text provides an adequate solution. GIS systems are more flexible than printed maps, because many pieces of information can be presented in relation to each feature or area. In our project, we linked a database to the GIS which allowed a range of attributes to be recorded for each block of each character type. This allows the user of the data to build up a picture of the historical development of the landscape.

Because HLC is a flexible method it can be adapted to suit different places and include a range of differing perspectives. Where landscapes exhibit long-term stability HLCs are often used to map landscape types with ancient origins (Turner 2007: 43-60), but the method can also be applied to analyse more recently-created landscape types (Dingwall & Gaffney 2007). Since the data is held in a GIS, it is easy to add data or change the information linked to each unit. HLCs that have been 'finished' should not be regarded as complete: new interpretations or perspectives on the landscape will demand additional data or new characterisations. HLC is not a monolithic approach, and different workers might choose to characterise the same area in different ways in response to different research questions (Turner 2006a). Since landscape histories vary from region to region, different HLC types will be appropriate in different places. In addition, characterisations can be undertaken at any scale and for a range of different uses (e.g. research on various periods' landscape histories, to inform landscape management or for spatial planning). The nature and intended uses of a characterisation will affect how it looks and what HLC types are chosen for mapping (compare e.g. Foard *et al.* 2005; Turner 2006b, 2007). The HLC method is therefore very flexible.

Naxos and Thrace: two pilot Mediterranean HLCs

Our method and database were modelled on a recent UK HLC project (Turner 2007), though significantly adapted to suit our Mediterranean case studies' landscapes and sources. We chose ESRI's ArcGIS 9.1 to undertake the mapping, and the data relating to each individual block of a specific landscape character type (a 'polygon' or 'geometry') were recorded and stored using a Microsoft Access database.

We used three principal sources to inform our characterisations:

1. IKONOS 1m black-and-white and 4m multispectral satellite data supplied by European Space Imaging LLC, Munich (and acquired 2006-7).
2. Historic maps. The main historic source for the Silivri (Thrace) study area comprised a version of a British Ordnance Survey map produced at 1:25 000 in *c*. 1943. This map was based on an Ottoman survey made after the first Balkan War (1912-13) and is available in the British Library, London.
3. Historic air photography. Most of our Naxos pilot study was covered by RAF air photos taken during sorties in 1943 (we were unable to identify comparable wartime photography for Silivri). The photographs were scanned and supplied by the Keele University Air Photo Unit (this collection has since moved to the Royal Commission on the Ancient and Historic Monuments of Scotland (RCAHMS) in Edinburgh).

Where relevant, we referred to other digital sources including twentieth-century 1:50 000 Russian military maps and Google Earth (though when we undertook our HLC mapping (April–July 2007) high-resolution imagery was only available via Google for the western half of the Naxos study area. The methods we used to rectify and reference the satellite imagery and air photographs are described separately: see Crow & Turner 2008).

We deliberately limited the number of HLC types for our pilot HLCs in order to keep the database user-friendly; further development could result in more detailed characterisations. First, we recorded the present-day character type based on the evidence from the IKONOS satellite imagery. Second, we made an interpretation of earlier phases of landscape character using all available sources. As far as the sources we used allow, we can attempt to model earlier patterns of land-use, and try to trace which landscapes have remained most stable and which have changed the fastest.

The HLC types we have used to map our Naxos and Silivri study area for this project are shown in Tables 1 and 2. The following section describes the rationale behind our choices for a few common character types (for more on the other types see our website, Crow & Turner 2008; for discussion see Crow & Turner 2009).

Naxos: braided terraces

Many of Naxos' steep hillsides are terraced, so terraces were an important historic landscape type to consider in preparing our characterisation of this intricate and fine-grained landscape (Figures 2 and 3). Oliver Rackham and his collaborators have identified six main terrace types that are widespread in the Aegean: braided terraces, contour terraces, straight step terraces, check-dams, terraced fields and modern false terraces (Rackham & Moody 1996:

Table 1. Naxos HLC types.

Enclosures	**Rough ground**
Enclosures (modern)	Rough ground (post-medieval/medieval)
Enclosures (post-medieval)	Rough ground (modern/post-medieval) *with* Enclosures (post-medieval)
Enclosures (post-medieval) *based on* Fields (medieval)	Rough ground (modern/post-medieval) *with* Enclosures (post-medieval) *based on* Braided terraces (medieval)
Enclosures (post-medieval) *with* Braided terraces (medieval)	Rough ground (modern/post-medieval) *with* Braided terraces (medieval)
Enclosures (post-medieval) *with* Step terraces – straight/contour (post-medieval)	Rough ground (modern/post-medieval) *with* Terraces [other types]
Olives (modern)	Woodland (modern/post-medieval)
Olives (post-medieval)	Outcrop, scree, cliff
Horticulture (modern/post-medieval)	Sand
Terraces	**Settlement**
Braided terraces (medieval)	Settlement (modern/post-medieval/medieval)
Check-dams (medieval/post-medieval/modern)	Villas (modern)
Step terraces – contour (modern/post-medieval)	Recreation (modern)
Step terraces – straight (modern/post-medieval)	Orchard
Terraced fields (modern/post-medieval)	
False terraces (modern)	
	Industrial
	Industrial (modern)
	Quarry (modern/post-medieval)

140-5; Grove & Rackham 2001: 108). We have adapted this classification as the basis for our terrace HLC types. Here we discuss braided terraces in order to illustrate how our HLC types were classified.

Recent debate shows the terraces of different Aegean landscapes have widely varying origins, from prehistory to the twentieth century (Betancourt & Hope Simpson 1992; Brunet 1999; Price & Nixon 2005; Forbes 2007). On Naxos, as on other Cycladic islands, there are very many areas where drystone field boundaries cut across earlier terraces (e.g. Kea: Whitelaw 1991). Virtually all examples of braided terraces on Naxos are overlain by walls that divide the terrace systems into discrete blocks (Figure 3). Individual terraces sometimes abut these walls, but invariably other terraces within the same system underlie them. This shows that braided terrace systems have witnessed long (possibly discontinuous) periods of use with several phases of development. The underlying terraces must antedate the walls, which themselves are no later than the eighteenth or nineteenth centuries in the vast majority of cases (almost none have been newly built since the 1940s).

Late-medieval visitors to the Aegean noted the presence of terraces, including areas of desertion (Harfouche 2007: 153). On Naxos, seventeenth-century documentary sources refer to *louroi*, which may represent terraced subdivisions of large 'open' fields called *engairies*. These *engairies* occurred across much of the island – probably in every estate and village

Table 2. Silivri HLC types.

Strip fields	**Rough ground**
Strip fields (modern/post-medieval/ medieval)	Marsh
	Other woodland
	Rough ground
	Thracian forest
	Water
Fields	**Settlement**
Fields (modern/post-medieval/medieval)	Recreation
Fields–grid (modern)	Transport
Fields (modern) *based on* fields (post-medieval)	Village
Fields (modern/post-medieval) *based on* coaxial fields (post-medieval)	Villas
Fields (modern/post-medieval) *based on* strip fields	Urban
Coaxial fields (post medieval)	
Meadow	**Industrial**
Orchard	Industrial
Horticulture	Quarry

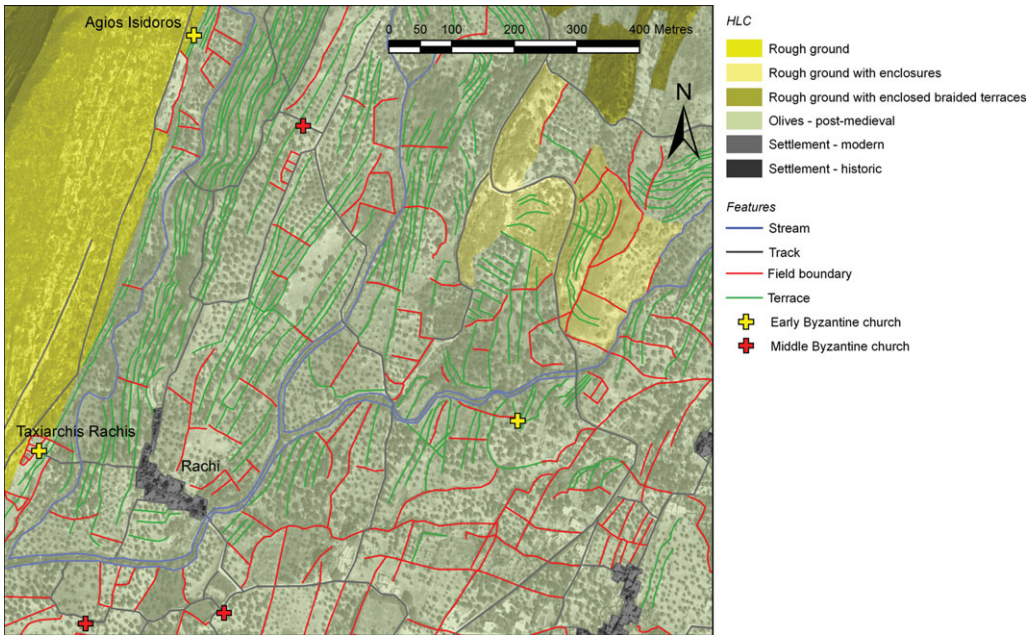

Figure 2. Naxos HLC, with selected landscape features and Byzantine churches around Rachi, Naxos. IKONOS 1m black-and-white data. (Includes material ©2007, Space Imaging LLC. All rights reserved).

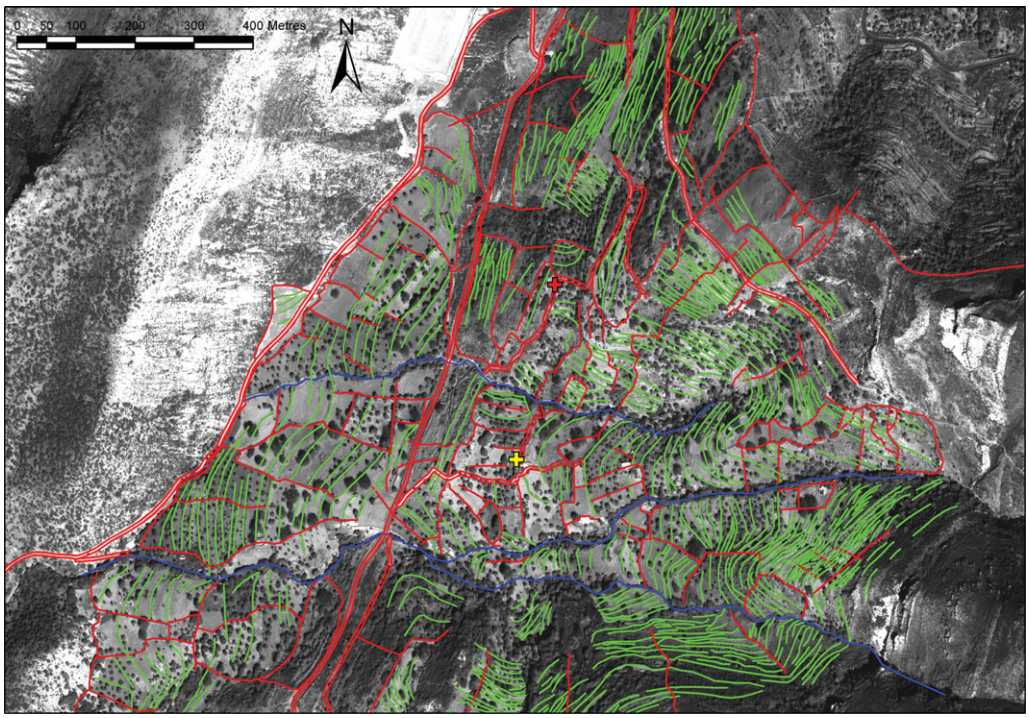

Figure 3. The valley of Aria, Naxos, showing terraces (green), walls and lanes (red) and streams (blue). IKONOS 1m black-and-white data. (Includes material ©2007, Space Imaging LLC. All rights reserved).

(such fields, including terracing, were widespread in the Aegean: Whitelaw 1991: 410-11; Kasdagli 1999: 99-101; Forbes 2007: 195-9).

In a soil erosion study undertaken from 1989-1992, Rainer Lehmann tentatively suggested many Naxos terraces may have been cultivated last between the fourteenth and seventeenth centuries (Lehmann 1993). Lehmann's general conclusions support the possibility that braided terrace systems could have medieval origins (but cf. Grove & Rackham 2001: 264-5). Many dated monuments on Naxos appear to stand on terraces, hinting at the antiquity of the latter. Examples include the early Byzantine churches of the Taxiarch and Agios Isidoros in Rachi, where both buildings perch on long terraces constructed along the hillside (Figures 4 and 5). Field survey also hints at the antiquity of Naxiot terrace systems. Around the early Byzantine church of Ag Kyriaki, north-east of Apeiranthos, analysis of fieldwalking data by Athanasios Vionis for the 2nd Ephorate of Byzantine Antiquities suggests that up to 70 per cent of the ancient finds collected belong to the seventh to ninth centuries AD. Curving drystone walls around small fields here only partially and untidily enclose the terraces, which are probably related to the early Byzantine settlement. It seems likely that whatever the original date of Naxos' braided terrace systems, the vast majority would have existed in or before the seventeeth century. In our HLC database most are interpreted as 'enclosures (post-medieval) with braided terraces (medieval)'. Though tentative, we have suggested other dates for other terrace types (Crow & Turner 2008). This kind of analysis

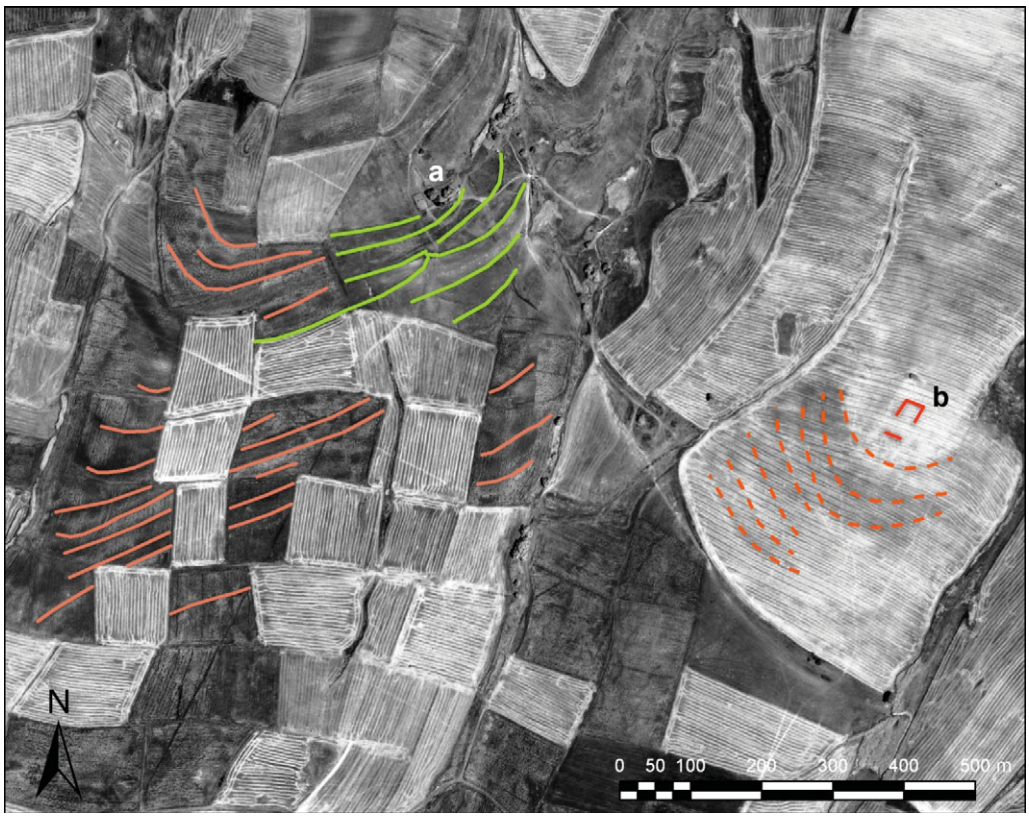

Figure 4. The ridge of Eski Fener Tepesi, showing remains of probable medieval strip fields (as earthworks and cropmarks) overlain by post-medieval coaxial fields. (green = lynchets, red = cropmarks. 'b' represents the site of a probable Roman farmstead). IKONOS 1m black-and-white data. (Includes material ©2007, Space Imaging LLC. All rights reserved).

allows us to build up simple models of how the farmed landscape of Naxos may have developed over the historic periods using the data recorded in the HLC.

Thrace: coaxial fields

In contrast to Naxos, the boundaries between fields around Silivri are marked by low baulks topped with long grass or weedy vegetation, or sometimes by earthworks, which can range from less than 0.10m high to over 1m. The baulks between the fields appear fragile and impermanent, but it is clear that in many parts of the study area they are of considerable antiquity: for example, the line of the Anastasian Wall still acts as a field boundary in places, even though the monument itself has been completely destroyed and levelled (Crow 2006).

The field systems we have called 'coaxial' are typified by blocks of roughly rectangular fields including long, roughly parallel but slightly sinuous axial boundaries (Figure 4). In our study area they occur particularly around the village of Fener, 8km north of Silivri. Individual fields are typically *c*.100 x 140m, and rarely as much as 200m across. Some are smaller with sides of around 70m, particularly immediately outside the village. These 'coaxial fields' probably date to a phase of landscape reorganisation in the early modern period. In places, more recent fields have clearly been created by subdividing coaxial fields, for example,

Figure 5. Photograph showing the lynchets visible in Figure 4 to the south of the settlement (hidden in the trees and marked with 'a' in Figure 4). Sam Turner, July 2007.

the block that runs along the east bank of the Fener Dere. It seems likely that these fields were broken up into orchards or horticultural plots, as suggested by both the Ottoman/OS map and the unusually frequent occurrence of trees in today's boundaries. In other places, our retrogressive analysis suggests that certain roads depicted on the Ottoman/OS map post-date the coaxial fields, strongly suggesting a post-medieval date at the latest. Elsewhere, on the slopes of the ridge running east from Fener, we identified a probably medieval strip field system preserved both as earthworks and cropmarks that clearly underlies the pattern of coaxial fields (Figures 4 and 5).

The detection of varying patterns of field systems around different villages and the recognition of their diverse periods of origin has allowed us to appreciate the time depth in this historic landscape for the first time (Crow & Turner 2009; Figure 6).

HLC: prospect and limitations for research applications

For research, HLC allows us to relate broad patterns in the historic landscape to particular classes of monuments, boundaries and other significant cultural features. Because we can trace landscape change, we can also relate changing distributions of monuments to changing patterns of land-use. For example, on Naxos there is a density of Byzantine churches virtually unmatched anywhere in the Mediterranean. By plotting these against our HLC, we can identify how they related to areas exploited by contemporary people in different ways, and how patterns of church foundation varied over time (Figure 2). HLC therefore provides an effective way to bring together aspects of economic/functional and social/symbolic landscapes (Turner 2006b; see Nixon 2006: 7-11; Forbes 2007: 16-18).

As made clear above, our interpretations of HLC types rely to a significant degree on analogies from previous historical and archaeological work. In much of the Mediterranean, little attention has been given to dating the origins and development of this 'landesque

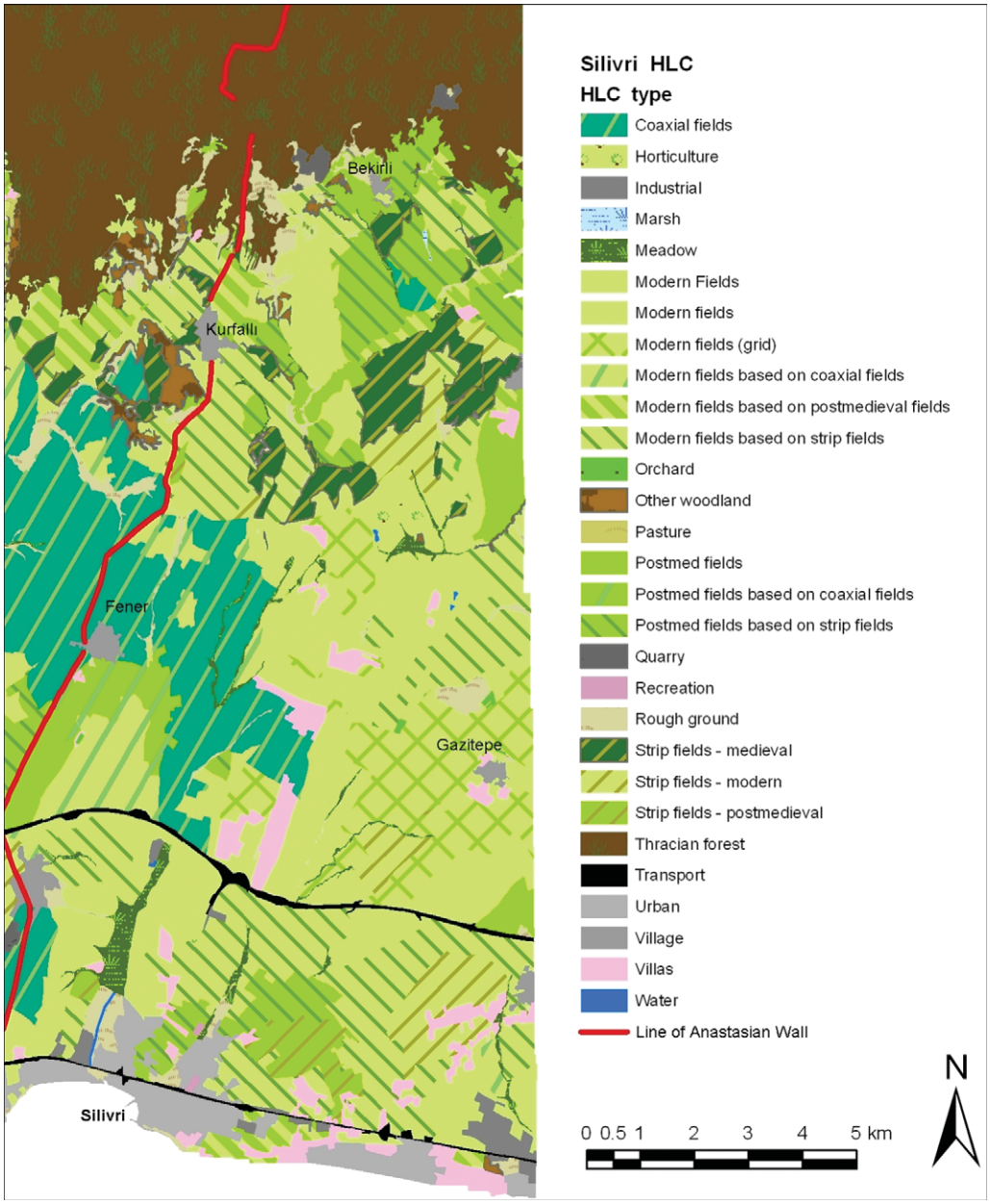

Figure 6. HLC of Silivri and its hinterland in Thrace, Turkey.

capital' (Widgren 2007). To improve our interpretations, it is important to undertake appropriate survey, excavation and historical research in the future with these aims in mind.

More fundamental problems are how to relate landscape form to historical processes, and how to understand the relations between structure and agency that gave rise to particular landscapes at particular times. For example, it is very hard for us to know exactly what

circumstances gave rise to patterns like the coaxial fields we identified around Fener. Here, though, historical archaeologists are at a particular advantage because they can combine a wide range of relevant approaches, from excavation and survey through historical studies to ethnographies and folklore. Landscape has provided an important medium for negotiating social and economic relationships, and changes in practice are inscribed into its 'palimpsest'. Using a wide range of sources can help us create rich, contextual understandings of societies and places, and to analyse both the detailed causes and the effects of change in the past (Trigger 2006: 534-6). Using GIS, we believe HLC and related methods could provide unifying spatial frameworks to allow these different perspectives and sources to be brought to bear on particular questions about the past.

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